

FINCH ENVIRONMENTAL, INC.
799 South 680 East
Canyon Cove
Payson, Utah. 84651

Phone: 801-465-8140
Mobile: 801-361-0469
Fax: 801-465-8139
E-mail: rfinch@sisna.com

PROPOSAL

INTERMOUNTAIN POWER SERVICE

Attn: Phong Do
850 West - Brush Wellman Road
Delta, Utah. 84624

Dear Mr. Do,

As per your phone call requesting a quote and our recent visit to your plant Finch Environmental proposes the following work:

- 1- Provide skilled man power, equipment, and materials to design and install a ladder-vane baffle in the #6 coal system baghouse.
Scope: The scope of work would be to remove the existing baffle from the unit, prep and install a new baffle to better facilitate slowing of airflow, agglomeration and fallout of particle, abrasion resistance to hopper, housing, and filter media, and better distribution of grain load across the filter media.

BAFFLE PRICE:

Price includes steel, travel, expenses, and labor to design and install.

TOTAL = \$ 1,967.00

CUSTOMER RESPONSIBILITIES:

- Remove bags and cages to provide access and safe working conditions in the collector.
- Ensure that the hopper is empty and clean of material.
- Assist with lock-out- tag-out of the equipment during work.
- Provide access for tool trailer, welder, and cutting gases.
- Provide Hot Work permit and confined space permit as necessary to comply with IPP policy.
- Provide access to normal restroom and wash facilities.
- Provide 110V power within 50 ft. of the collector.

IP12_004773

FINCH ENVIRONMENTAL RESPONSIBILITIES:

- Conduct a clean, safe, and professional project.
- Provide materials, tools, design, and labor to complete project in a timely manner.
- Keep work area clean and free of debris which may cause a safety hazard.
- Provide proper locks for equipment safety and PPE for worker safety on project site.

It is estimated that the baffle will be completed within one 12 hour day where in the unit will be turned back over to IPP maintenance department.

2- BAG & CAGE REMOVAL & REPLACEMENT:

If Intermountain Power Service would desire a complete "Turn Key" project wherein Finch Environmental Inc. would remove and replace the filter media this can also be accomplished.

It was also recommended that Pulse-Pleats be considered to replace the current bags and cages in this unit for increased hopper area. The cost for labor to install Pulse-Pleats is the same as the cost for bags and cages in this unit.

BAG REFURBISHMENT COST: \$ 1,260.00

3- SYSTEM BALANCING:

System balancing typically would take 4 to 5 hours of on-site time to properly complete.

The system would need to be operating at normal to maximum production rates.

Finch Environmental Inc. would provide equipment and manpower to balance the system under these normal operating conditions.

Finch Environmental Inc. to provide labor and equipment.

With travel, set up, and the project time it usually takes a full day.

TOTAL COST OF BALANCING: \$ 750.00 Each System

4- AIR POLLUTION CONTROL EQUIPMENT TRAINING SEMINARS:

Training seminars can be performed at IPP plant site upon customer request. The seminars will be focused on catering to the type of equipment on plant site.

Seminars educate on proper functionality and ways to improve operation, increase life, and reduce maintenance.

The number of attendees is not limited.

Seminar pricing is per day. Depending on how in depth the desired information, the seminars are catered to 2 hr. – 4 hr. – and 6 hr. block sessions. With lunch and breaks, the 6 hour training becomes a 7 to 8 hour day. This enables the plant to have one large group in an in depth seminar or two or three groups attending smaller shorter basic functionality, troubleshooting, and maintenance seminars.

You choose what works best for your daily time frame and how much you want to get out of your day.

TOTAL SEMINAR COST PER DAY: \$ 750.00

Thank you for the opportunity to quote you on these projects. Finch Environmental looks forward to assisting you in all your air pollution control needs.

Sincerely,

Reed C. Finch
President
Finch Environmental Inc.

FINCH ENVIRONMENTAL, INC.

110 South Main Street

P.O. Box 539

Payson, Utah 84651

Office: 801-465-8140

Mobile: 801-361-0469

Fax: 801-465-8139

E-mail: rfinch@sisna.com

November 26, 2006

To: Dahl Dalton Maintenance Engineering Dept.
IPSC – Intermountain Power Service Corp.
Delta, Utah Plant

From: Reed C. Finch Air Pollution Control Specialist
Finch Environmental, Inc.
Payson, Utah

Subject: Quick Lime storage silo bin vent inspection & recommendations report.

Equipment: Quick Lime bin vent dust collector – water treatment operations.

Dear Mr. Dalton,

The following is a brief summary of our findings and recommendations from the inspection of the bin vent on top of the quick lime bin at the water treatment facility.

FILTERS:

The inspection found the filters to look in fair to good condition. No moisture ridden dust cake was found on the filters. The lime dust that was adhered to the filters was dry and easily removed. The filters appeared to be singed or Teflon coated as there were no visible felt fibers exposed to the collection side of the filter media.

Visible inspection of the filters without removal cannot determine blinding of the media but the color and texture were pristine and in good condition showing no visible signs of breakdown, fatigue, blinding, or bleedthrough.

CLEANING SYSTEM:

The baghouse is a bottom load Pulse-Jet unit with 4 rows of bags and six bags per row for a total of 24 filters.

The unit is fixed with a timer board holding 4 outputs to a 4 solenoids associated with a diaphragm for each row.

The diaphragms are single internal diaphragm valves with ¾" NPT pipe connections and ¾" diameter pipe blowpipes. The cleaning energy provided by the ¾" single diaphragms

IP12_004776

is minimal but by design should be properly relative to the induced draft created by the baghouse fan.

What is meant by this is that the cleaning energy must be sufficient to flex the filter and release the agglomerated dust cake from the bags and allow it to drop off and into the bin against the volume and velocity of induced draft displacement air created by the dust collector ID fan.

The cleaning system is small but would ordinarily be sufficient.

PROBLEM:

With the dust collector running, vacuum was created sufficient to pull the DC door closed and create a seal. It was very hard to pull it open.

When the transfer process was started however the positive pressure and volume were much greater than the vacuum created by the DC fan and the DC door was pushed open creating a very positive environment in the vessel and dust collector.

- a- The DC fan and collector appears to be undersized for the material transfer blower.
- b- Or, the blower is oversized for the designed bin vent dust collector.

The purpose of the bin vent is to alleviate transfer air while separating product from the gas stream. It should be sized to handle the CFM provided by the material blower and the grain load that it transfers.

CFM of air volume numbers for the DC fan and lime material blower were not provided during this inspection but it appears that the DC is not able to handle the volume of air and grain load.

Note: During inspection one of the first things noticed was that the bin vent housing was bulged as if it had seen a high positive pressure internally. These collectors are typically designed for 20" wg negative pressure. Positive pressures may affect the housing at lower pressures.

It may seem that the easy thing to do is to increase the size of the DC fan to keep the vessel negative during material transfer. This may not be the answer as increasing the vacuum volume may increase it above the air-to-cloth ratio design, can velocity design, and cleaning pressure design values. The result would be high dp's due to inability to release dust cake.

Changing collector volumes may or may not be a permitting issue as well on this unit.

In all cases the first thing that needs to be done is to find the volume of positive pressure and compare it to the DC negative design capabilities.

The dp gauge was not legible during this inspection but the airflow throughput through the filter media appeared to be good and the filters were breathing well.

A new 0-15" H₂O wc gauge is recommended to determine filter resistance during operation and cleaning.

SUMMARY:

Internally the dust was dry and easily removed from the filters. The filters are in good condition and appear to be sufficiently permeable.

The material transfer blower volume relative to air and possibly grain load appears to far exceed the dust collector and its associated fans ability to keep the vessel negative. It is not able to effectively alleviate the displaced air therefore the vessel is under a positive pressure creating dusting and poor operation.

It was also noted by the operator that the positive pressure effects the bottom discharge area of the silo and mixing area as the pressure pushes a large amount of lime from the bottom of the vessel under the positive pressure created during material transfer. It appears that this area and the top inspection hatch are the least paths of resistance and become the areas of venting the air not handled by the bin vent fan.

We appreciate the opportunity to serve you in this capacity. Please contact us with any questions or additional needs relative to this unit or any of your pollution control equipment.

Sincerely,

Reed C. Finch
Air Pollution Control Specialist
Finch Environmental, Inc.

801-361-0469
rfinch@sisna.com

To: Intermountain Power Service Project
Mr. Phong Do

February 10, 2005

From: Finch Environmental, Inc.
Reed C. Finch

Subject: Balance #4 Dust Collector System

Dear Mr. Do,

Thank you for the opportunity to help with the improvements to your air pollution control equipment. It is always a pleasure to work with the good people at IPSC.

The following information is a summary of the work accomplished in the #1 transfer building in relation to balancing the multiple pick up point #4 dust collector system.

The dust collector system was not balanced properly due to changes made to the fan damper and the slide gates/blast gates over time. Improper airflow can reduce induced draft to necessary areas while allowing for high vacuum to others. In both cases the system will not function properly as some areas will see heavy dusting while the dust collector pulls a high and unnecessary grain load of coal dust in others.

The purpose of the project is to adjust and balance the system to facilitate proper vacuum at all points while maintaining proper airflow and speed of airflow in the ductwork and to the collector filter media. It should also reduce the recirculation load which will increase the flow of coal to the bins and mills.

- The dust collector was pulling a high vacuum pressure of 14.5" H₂O.
- Velocities were high in some areas and low in others.
- The fan damper position needed adjusting as did all of the blast gates at all 12 pickup points.

IP12_004779

PROCEDURE:

Blast-gate field balancing procedure:

- 1- Moved all blast gates to their full open position.
- 2- Adjust Photohelic clean on demand set points to proper position and allow for differential pressure to stabilize across the filter media.
- 3- Adjust fan damper to achieve the design flow & vacuum for the system. This is determined by calculated CFM, metered static pressure, and fan motor amperage.
- 4- The blast gates are then adjusted in proper order from the collector out to achieve 1.0" H₂O negative or by moving the blast gate in until the vented area starts puffing or pressurizing, then moving the gate out until the puffing stops under normal or maximum material load. This process may need to be repeated several times as adjusting one vent affects the others in the system.
- 5- Verify pressures and amperage after each time adjusting if necessary.
- 6- Repeat steps 4 & 5 as necessary until system is completely balanced.

The system has 12 points meaning that there needs to be at least 12" wc static pressure at the fan. Typically there needs to be just a little more to allow for pressure drop across ductwork changes in direction.

FINAL RESULTS:

Fan static-	12.5" wc
Motor Amps-	Safe
Duct velocity-	Avg. 3,650 FPM
CFM-	3,200 = safe range.
Differential pressure-	4.0" H ₂ O

The system balanced out well at the end of the day with all values at safe or optimal levels.

The process takes a full day but the long and short term benefits are great in relation to reducing maintenance in both clean up and repair as well as lowering power consumption and compressed air energy usage. The filter media not only works better but lasts longer in a dry balanced atmosphere.

Thank you again for the opportunity to assist you in this capacity. We trust that the completed project and the information found herein will be beneficial as we work together to maintain, repair, and upgrade your air pollution control equipment.

Sincerely,

Reed C. Finch
Finch Environmental, Inc.

MEMORANDUM

INTERMOUNTAIN POWER SERVICE CORPORATION

TO: George W. Cross Page 1 of 3

FROM: Dennis K. Killian

DATE: January 27, 2005

SUBJECT: Suggestions for Improving Dust Collector Operation and Maintenance

We have completed the dust collector survey and recommend the following to improve dust collector operation and maintenance:

1. Add an additional differential pressure switch to the controls for high differential pressure alarm. The existing two switches should be used to start and stop the cleaning cycle only. Estimated cost, \$500 per collector.
2. Balance the dust collector total air flow and air flow to each pick-up point. Weld all dampers in the correct location so that they cannot be changed.
3. Seal all locations where water can leak into the systems and reduce the amount of runtime during wash downs.
4. Prepare a written procedure for dust collector troubleshooting that can be used by Operations to resolve high differential problems without replacing the bags.

If these suggestions fail to reduce the differential pressure to acceptable levels, the following more extreme courses of action can be taken.

1. Install pleated bags to reduce the air to cloth ratio as needed. Cost varies with the size of the collector.
2. Install internal baffles to direct the coal dust down into the hopper instead of directly impinging on the bags.

Revise Cleaning Controls

The current system uses a dual set point differential pressure switch to provide all control and alarming functions. The set points can be adjusted from the control panel by turning two knobs located on the differential pressure gauge. The high

pressure setting initiates the cleaning cycle and the low pressure setting turns off the cleaning cycle. The high pressure setting also initiates a "High Differential Pressure" alarm if it does not clear after the cleaning cycle is in service for more than two minutes. The initial design settings were six inches of water to initiate the cleaning cycle and four inches of water to turn it off.

Unfortunately, some personnel have learned that the high differential pressure alarm can be cleared by simply adjusting the upper set point using the knobs provided on the control panel and we have often found the needle at the highest possible setting. This means the cleaning cycle does not initiate until the bags are blinded and the differential pressure has driven the dust into the fabric. We have no problem with a high setting for the differential pressure alarm (approximately 10 inches of water), but the cleaning cycle should initiate at the design settings. We believe this change will greatly reduce the number of high differential pressure alarms.

Upon your approval, we will work with I&C to make this change as quickly as possible.

Balance the Systems

The following table shows the current air flows to each dust collector.

Table 1: Air Flow Survey							
DC	Photohelic Set Point		A/C ratio		Air flow rate, CFM		Comment
	Actual	Design	Actual	Design	Actual	Design	
1A - D	4.0/9.05	4.0/6.0	4.6:1	< 6.4:1	52,124	73,500	
4	4.0/9.5	4.0/6.0	3.9:1	< 6.4:1	20,496	34,000	
5	3.0/9.0	4.0/6.0	8.1:1	< 6.3:1	32,829	26,000	High A/C
6	5.0/8.0	4.0/6.0	7.4:1	< 6.3:1	20,069	17,500	High A/C
11	3.5/10.0	4.0/6.0	6.5:1	< 6.3:1	17,577	18,000	
13A		4.0/6.0		< 6.25:1		33,000	
13B	4.0/9.5	4.0/6.0	7.1:1	< 5.99:1	19,215	16,500	High A/C
14A	3.0/9.5	4.0/6.0	7.9:1	< 6.5:1	23,157	19,500	High A/C
14B	4.0/9.2	4.0/6.0	6.3:1	< 5.99:1	17,080	16,500	

As you can see, most of the dust collectors have lower than designed air flow but, some are significantly higher. Low air flow reduces the amount of dust collected at each pick point and reduces the differential pressure across the bags. High air flow

picks up more dust than needed and increases the differential pressure at the baghouse. We recommend that Maintenance contract with a testing firm to balance and set the dampers to provide the correct total and branch air flows and that the balancing dampers be welded so that they cannot easily be adjusted.

Seal Locations for Water Ingress

A recent inspection of the baghouses by a representative from BHA (see attached report) found many locations where water can leak into the dust collectors fouling the bags. Of particular concern were the doors at the top of the collectors where water can frequently pool. These areas should be sealed to prevent ingress. Laborers should be instructed to keep these areas as dry as possible.

Dust Collector Troubleshooting Guidelines

Maintenance has indicated that there have been times when they get work orders to fix high differential pressure, only to find that the cleaning air has been valved out or the set point changed. We believe that a checklist of corrective actions might be helpful for plant personnel to solve problems without generating work orders for Maintenance to schedule and resolve.

Pleated Bags and Baffles

In the event that the above changes do not reduce the differential pressure enough to get out of alarm, pleated bags are available that will increase the surface area of the cloth. This is much more economical than any other method of increasing the filter cloth area. BHA also recommends installing a baffle in some locations to direct the incoming air flow away from the cloth. Again, we recommend doing this only after the other modifications have proven to not completely solve the problem.

If you have any questions about these modifications please contact Phong Do at extension 6475.

George W. Cross
President and Chief Operations Officer

Date

PTD/JKH:jmj

Attachments

cc: Stan L. Smith
Jon A. Finlinson

IP12_004783



December 2, 2004

Intermountain Power Service
850 West Brush Wellman Road
Delta, Utah 84624

BHA Gro
8800 East 63rd
Kansas City, Missouri USA 64117
+1-816-331-1111
FAX +1-816-331-1112
www.bha.com
e-mail: info@bha.com
SALES 800-861-1111

Attn: Phong Do

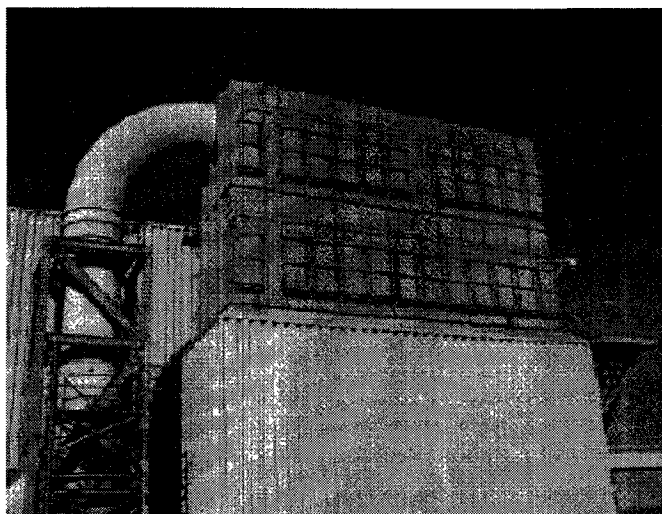
Ref.: BHA Technical Visit

Dear Phong:

Thank you for your hospitality during my visit to your plant the week of December 1st. The main purpose of the visit was to evaluate 8 of your coal handling dust collectors, which are having ventilation issues and bag life problems. The following is a summary of our observations and recommendations.

Attached you will find the Baghouse maintenance reports that give a glance look at the condition, settings, and airflow of the 8 units evaluated. Valuable information is found on these sheets showing the "As Found" condition of each unit inspected.

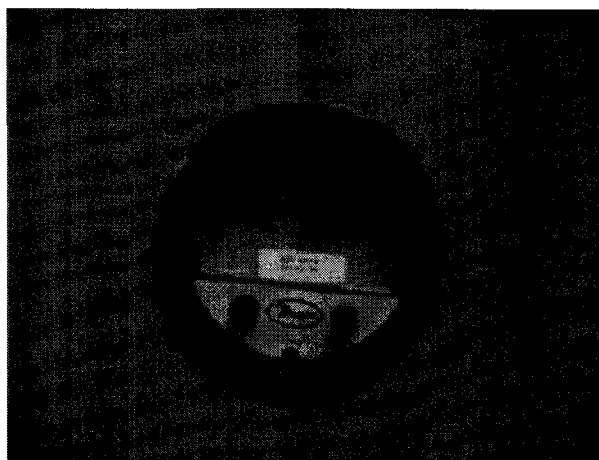
This portion of the report will simply talk about the issues and improvements that can be generally made. The comments will be made around pictures for ease of explanation.



World Leader in Innovative Filtration Technology

IP12_004784

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 2



One of the first and major issues found to be a problem was the differential set points for clean on demand capabilities.

In all cases, the set points were set very wide and generally on the high side.

As you can see in the above picture and on the attached sheets, the cleaning cycle will not start until it crosses over the upper set point at 10" DP H₂O. This is very high differential pressure that creates a high vacuum across the filter media and reduces draft on the pickup points or process. In many cases the low set point is so low that it may never be able to clean down to the level and stop the cleaning cycle. This means that the baghouse will continually clean unnecessarily stripping the bags of the necessary dust cake.

Other factors are that these set points create a large dump of material on the screw or rotary feeder often bringing about bridging and plugging.

The swings in DP make it impossible to balance a system with the slide gates at the pick up points. It insures varied draft and cannot be controlled well at all.

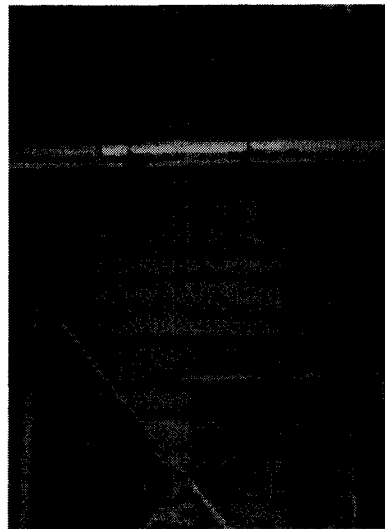
In short, these set points affect the system adversely upstream, downstream, and in the unit itself.

The set points should be brought in tight with a 1/2" window between them and set at 5.0" and 5.5".

Other options are to wire the lower needle to perform both start and stop of the cleaning cycle logic and use the upper needle for alarm.

You may also choose to use the PLC logic to set the points and control each unit using the analogue gauge as a DP reading gauge only.

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 3



The pyramid hoppers are small in size and the inlet ducts are high in the hoppers. The airflow is entering the units at a high rate of speed and do not have time or area to slow down. It is important that the airflow slow down to agglomerate material for fall out as well as reduce the velocity to well below 400 FPM prior to hitting the can area of the bags.

Inlet, hopper, and baffle design play a big part in the airflow and abrasion each unit sees.

Unit 6 needs to have a baffle design change to better distribute the grain load as it changes airflow.

Hopper area can and should be increased by changing from bag and cage to Pulse-Pleats. You will realize an increase in filtration surface area while shortening the filter elements creating an area for slowing and drop out.

It is recommended that all of the pyramid hopper units be converted over to the BHA Pulse-Pleat units on their next change out.

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 4



The current baffles are made of perforated plate with an angled diverter plate at the end. This plate is directing airflow in a concentrated pattern rather than slowing and distributing the airflow and grain load.



In the above picture, the hopper sidewall is being sandblasted to white metal in the direction of the outlet damper. Filter bags in a specific area are being abraded with the high grain load and velocity. You can see in the above picture that the hopper sidewalls are white metal around an area of original red oxide primer that has been left.



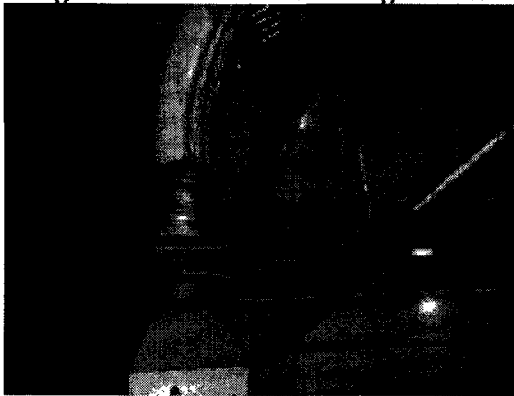
The result is reduced bag life and poor dust collector operation.

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 5



During the inspection it was noted that several of the units had doors that were leaking to atmosphere. These doors above are on the #4 unit. While standing on the unit you can hear the airflow leaking past the door seal. This pulls air from atmosphere through the clean air plenum rather than from the pickup points or process.

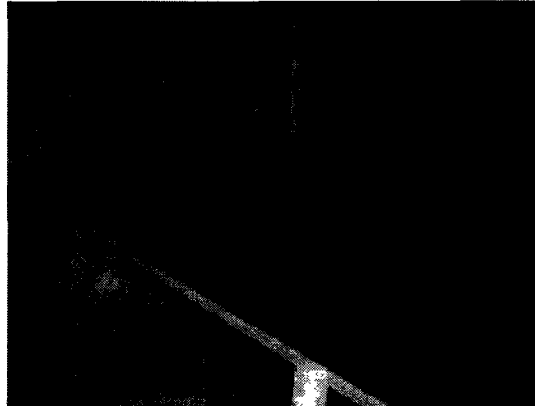
Another issue that appears to be prevalent is the washing down of the buildings with copious amounts of water. The water was everywhere in the buildings but most importantly it was being sucked into the units through the leaking doors.



Other areas of concern are too much water introduced at the pick up points. Remember that dust collectors are dry collection units. Water and dust make mud that is impermeable when attached to the surface of the filter media.

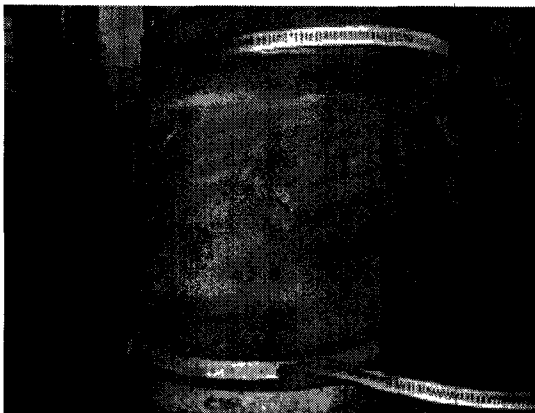
Doors and door gaskets need to be sealed as well as all pickup points.
Wash down water should be kept away from the pickup points and suction areas as much as possible.

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 6



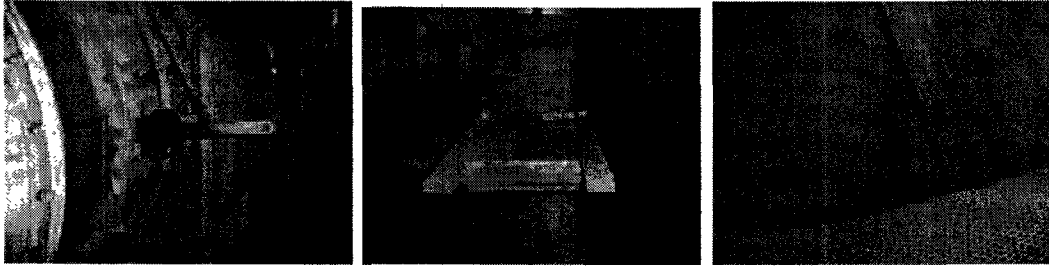
Belt conveyors and transfer points should be sealed up as much as possible.

In general, I found things to be sealed up fairly well. In the case of the picture on the left, the belt skirt board is missing requiring more vacuum to keep this area negative.



Expansion joints and piping should also be sealed to allow adjusted vacuum at the vent point and reduce moisture to the filters.

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 7



Each system needs to be balanced.

As mentioned in our on-site discussion, there are three effective dampers in each system.

- 1- ID Fan Damper
- 2- Slide gate or blast gates at pickup points
- 3- Filter bags and the dust cake or differential pressure maintained across them.

At this facility the fans are capable of more airflow than the design volume of the baghouse. Many of the units are pulling higher volumes than design.

The differential pressure then needs to be stabilized by maintaining a baghouse DP of 5.0" +/- 1/2". This will maintain a constant airflow across the baghouse.

Finally, the slide gates need to be balanced at each pickup point so as to keep the area or point negative without pulling product unnecessarily.

CLEANING CYCLE LOGIC:

Adjust to stagger cleaning cycle with two buffer rows between each cleaning row.

Output	Row
1	1
2	4
3	7
4	10
5	2
6	5
7	8
8	3
9	6
10	9

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 8



#10 row on the #6 unit is not firing the diaphragm. It may be an output, solenoid, or the diaphragm needing repair.

All rows should be in good working order. Not firing increases cake and is susceptible to combustion. It also reduced the overall air-to-cloth ratio pushing high loads to the remaining filter area.

SUMMARY:

- New Ladder-Vane baffle in #6 baghouse unit.
- Install BHA Pulse-Pleats in all single pyramid hopper units starting with #5 & #6.
- Install in-line separator and regulator prior to each manifold to reduce high cleaning pressure.
- Replace or repair door gaskets as needed and seal up all units to atmosphere.
- Balance all airflow systems. ID Fan Dampers - baghouse DP - Slide Gates.
- Create proper clean on demand set points.
- Install inline separator and regulator prior to each manifold to clean and reduce airflow. 80 to 90 psi on bag and cage - 65 psi on pulse pleats.
- Seal up all piping and pickup point areas.
- Educate through seminars maintenance and operations personnel on proper baghouse functionality.
- Adjust cleaning cycle logic or sequence to be staggered and identical to all units.

To: Intermountain Power Service - Delta, Utah
Date: Decemeber 2, 2004
Page: 9

We are confident that this information will be very valuable in planning, budgeting and improving your ventilation systems. BHA appreciates the opportunity to work with the good people at IPP and look forward to helping you implement the recommended changes.

Coni Williams will provide you with applicable quotes under separate cover and will be contacting you soon to review this report. In the meantime, if you have questions or require additional information, you can contact us at 1 800 821 2222.

Sincerely,

BHA Group, Inc.

Reed C. Finch
BHA Consultant/Technical Advisor

cc: Coni Williams - Sales Representative, BHA Group, Inc.

Leyana S. Shelton - Project Management, BHA Group, Inc.



December 2, 2004

Intermountain Power Service
850 West Brush Wellman Road
Delta, Utah 84624

BHA Group, Inc.
8800 East 63rd Street
Kansas City, Missouri USA 64133-4883
+1-816-356-8400
FAX +1-816-353-1873
www.bha.com
e-mail: info@bha.com

SALES 800-821-2222

Attn: Phong Do

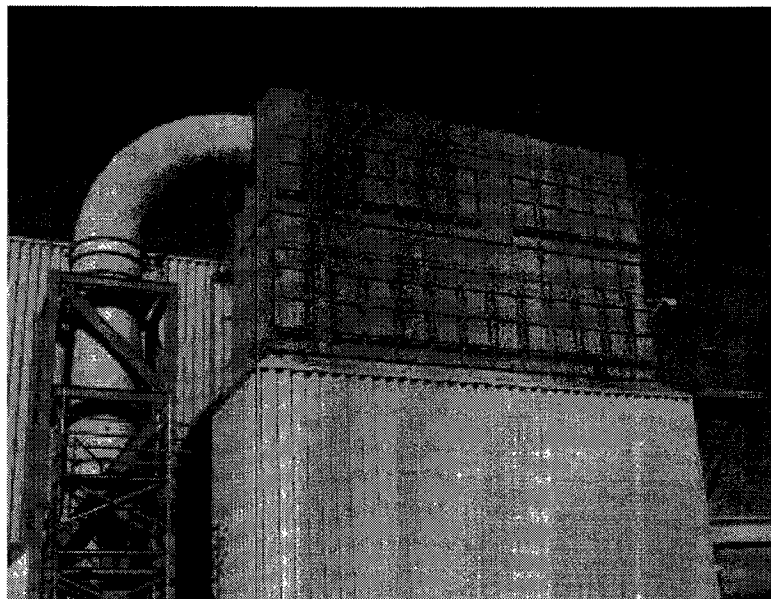
Ref.: BHA Technical Visit

Dear Phong:

Thank you for your hospitality during my visit to your plant the week of December 1st.. The main purpose of the visit was to evaluate 8 of your coal handling dust collectors, which are having ventilation issues and bag life problems. The following is a summary of our observations and recommendations.

Attached you will find the Baghouse maintenance reports that give a glance look at the condition, settings, and airflow of the 8 units evaluated. Valuable information is found on these sheets showing the "As Found" condition of each unit inspected.

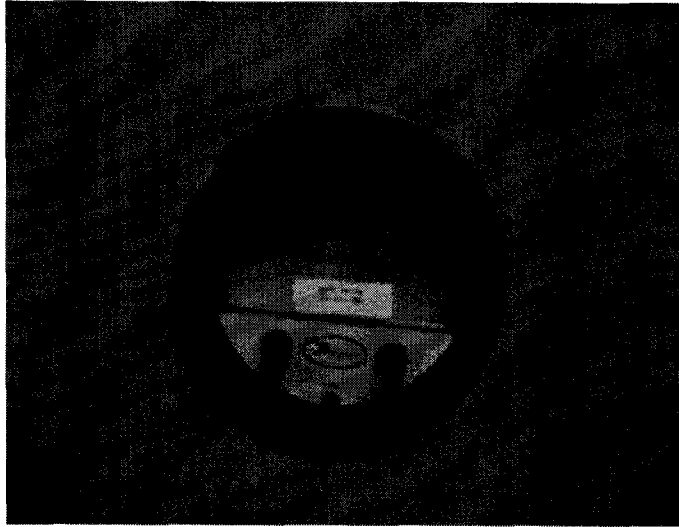
This portion of the report will simply talk about the issues and improvements that can be generally made. The comments will be made around pictures for ease of explanation.



World Leader in Innovative Filtration Technology

IP12_004793

To: Intermountain Power Service – Delta, Utah
Date: Decemeber 2, 2004
Page: 2



One of the first and major issues found to be a problem was the differential set points for clean on demand capabilities.

In all cases, the set points were set very wide and generally on the high side.

As you can see in the above picture and on the attached sheets, the cleaning cycle will not start until it crosses over the upper set point at 10" DP H₂O. This is very high differential pressure that creates a high vacuum across the filter media and reduces draft on the pickup points or process. In many cases the low set point is so low that it may never be able to clean down to the level and stop the cleaning cycle. This means that the baghouse will continually clean unnecessarily stripping the bags of the necessary dust cake.

Other factors are that these set points create a large dump of material on the screw or rotary feeder often bringing about bridging and plugging.

The swings in DP make it impossible to balance a system with the slide gates at the pick up points. It insures varied draft and cannot be controlled well at all.

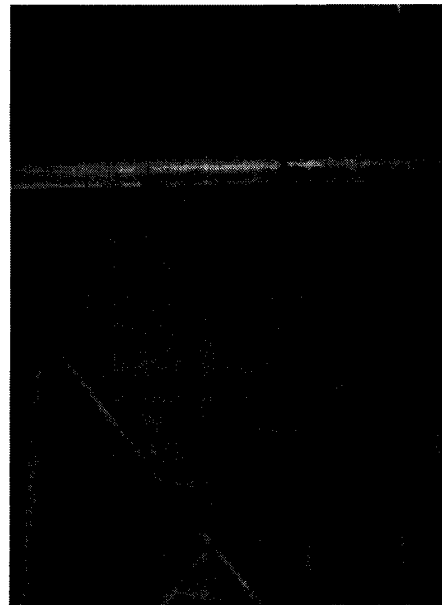
In short, these set points affect the system adversely upstream, downstream, and in the unit itself.

The set points should be brought in tight with a 1/2 " window between them and set at 5.0" and 5.5".

Other options are to wire the lower needle to perform both start and stop of the cleaning cycle logic and use the upper needle for alarm.

You may also choose to use the PLC logic to set the points and control each unit using the analogue gauge as a DP reading gauge only.

To: Intermountain Power Service – Delta, Utah
Date: Decemeber 2, 2004
Page: 3



The pyramid hoppers are small in size and the inlet ducts are high in the hoppers. The airflow is entering the units at a high rate of speed and do not have time or area to slow down. It is important that the airflow slow down to agglomerate material for fall out as well as reduce the velocity to well below 400 FPM prior to hitting the can area of the bags.

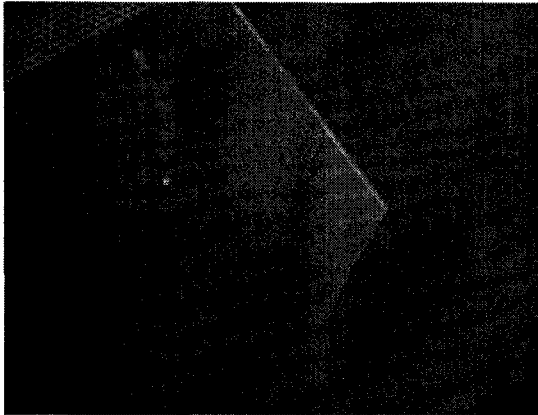
Inlet, hopper, and baffle design play a big part in the airflow and abrasion each unit sees.

Unit 6 needs to have a baffle design change to better distribute the grain load as it changes airflow.

Hopper area can and should be increased by changing from bag and cage to Pulse-Pleats. You will realize an increase in filtration surface area while shortening the filter elements creating an area for slowing and drop out.

It is recommended that all of the pyramid hopper units be converted over to the BHA Pulse-Pleat units on their next change out.

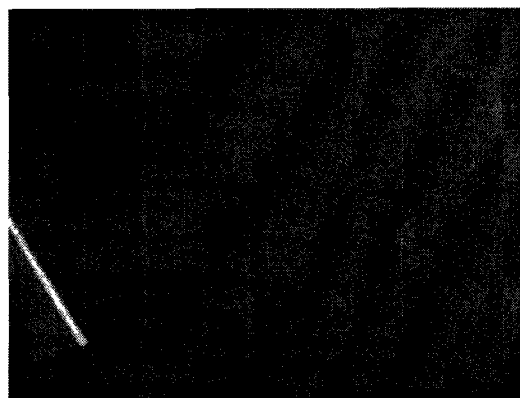
To: Intermountain Power Service -- Delta, Utah
Date: Decemeber 2, 2004
Page: 4



The current baffles are made of perforated plate with an angled diverter plate at the end. This plate is directing airflow in a concentrated pattern rather than slowing and distributing the airflow and grain load.

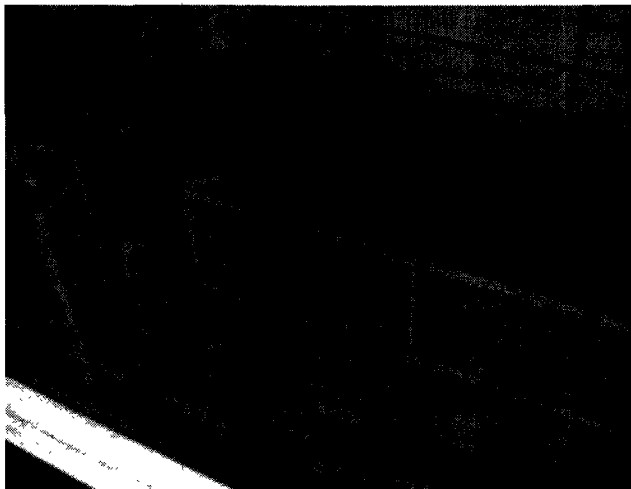


In the above picture, the hopper sidewall is being sandblasted to white metal in the direction of the outlet damper. Filter bags in a specific area are being abraded with the high grain load and velocity. You can see in the above picture that the hopper sidewalls are white metal around an area of original red oxide primer that has been left.



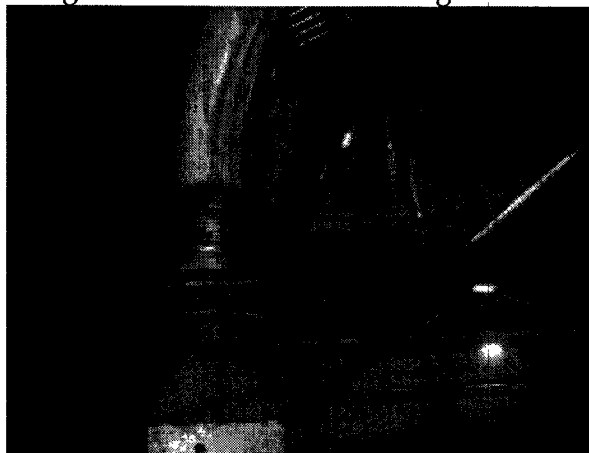
The result is reduced bag life and poor dust collector operation.

To: Intermountain Power Service – Delta, Utah
Date: Decemeber 2, 2004
Page: 5



During the inspection it was noted that several of the units had doors that were leaking to atmosphere. These doors above are on the #4 unit. While standing on the unit you can hear the airflow leaking past the door seal. This pulls air from atmosphere through the clean air plenum rather than from the pickup points or process.

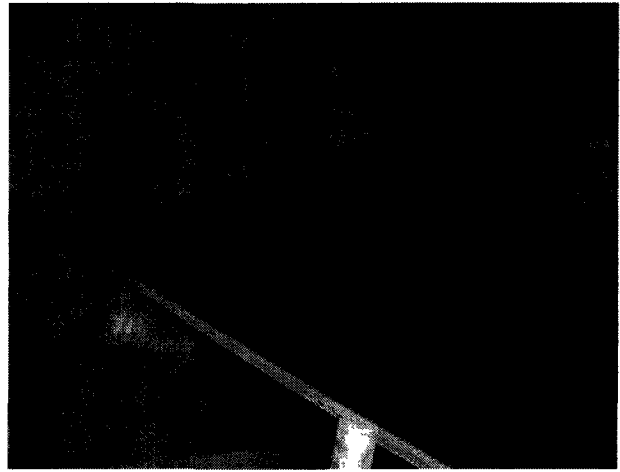
Another issue that appears to be prevalent is the washing down of the buildings with copious amounts of water. The water was everywhere in the buildings but most importantly it was being sucked into the units through the leaking doors.



Other areas of concern are too much water introduced at the pick up points. Remember that dust collectors are dry collection units. Water and dust make mud that is impermeable when attached to the surface of the filter media.

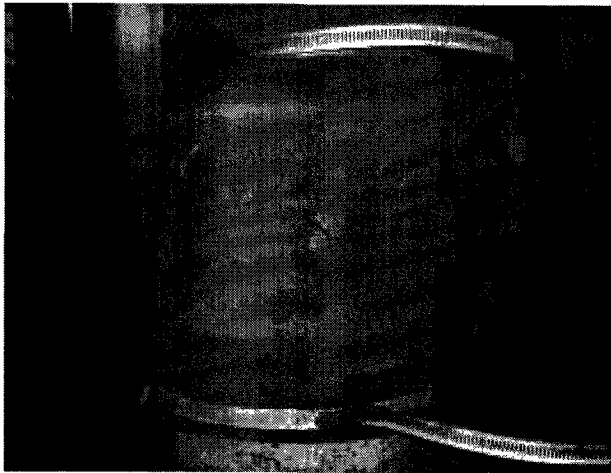
Doors and door gaskets need to be sealed as well as all pickup points.
Wash down water should be kept away from the pickup points and suction areas as much as possible.

To: Intermountain Power Service – Delta, Utah
Date: Decemeber 2, 2004
Page: 6

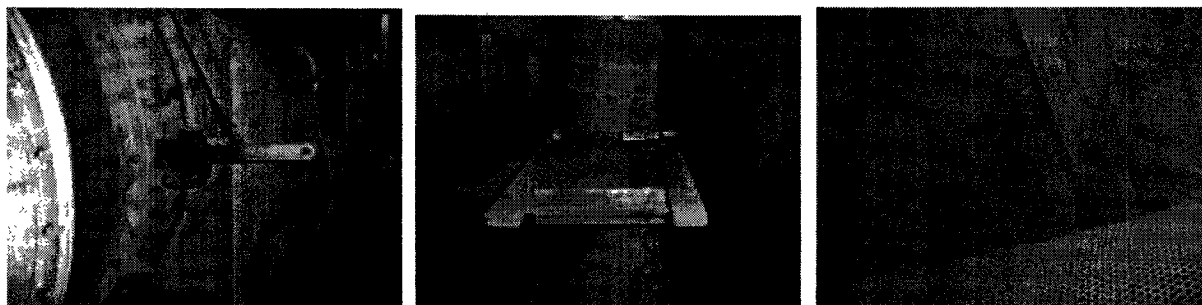


Belt conveyors and transfer points should be sealed up as much as possible.

In general, I found things to be sealed up fairly well. In the case of the picture on the left, the belt skirt board is missing requiring more vacuum to keep this area negative.



Expansion joints and piping should also be sealed to allow adjusted vacuum at the vent point and reduce moisture to the filters.



Each system needs to be balanced.

As mentioned in our on-site discussion, there are three effective dampers in each system.

- 1- ID Fan Damper
- 2- Slide gate or blast gates at pickup points
- 3- Filter bags and the dust cake or differential pressure maintained across them.

At this facility the fans are capable of more airflow than the design volume of the baghouse. Many of the units are pulling higher volumes than design.

The differential pressure then needs to be stabilized by maintaining a baghouse DP of 5.0" \pm 1/2". This will maintain a constant airflow across the baghouse.

Finally, the slide gates need to be balanced at each pickup point so as to keep the area or point negative without pulling product unnecessarily.

CLEANING CYCLE LOGIC:

Adjust to stagger cleaning cycle with two buffer rows between each cleaning row.

Output	Row
1	1
2	4
3	7
4	10
5	2
6	5
7	8
8	3
9	6
10	9

To: Intermountain Power Service – Delta, Utah
Date: Decemeber 2, 2004
Page: 8



#10 row on the #6 unit is not firing the diaphragm. It may be an output, solenoid, or the diaphragm needing repair.

All rows should be in good working order. Not firing increases cake and is susceptible to combustion. It also reduced the overall air-to-cloth ratio pushing high loads to the remaining filter area.

SUMMARY:

- New Ladder-Vane baffle in #6 baghouse unit.
- Install BHA Pulse-Pleats in all single pyramid hopper units starting with #5 & #6.
- Install in-line separator and regulator prior to each manifold to reduce high cleaning pressure.
- Replace or repair door gaskets as needed and seal up all units to atmosphere.
- Balance all airflow systems. ID Fan Dampers – baghouse DP – Slide Gates.
- Create proper clean on demand set points.
- Install inline separator and regulator prior to each manifold to clean and reduce airflow. 80 to 90 psi on bag and cage – 65 psi on pulse pleats.
- Seal up all piping and pickup point areas.
- Educate through seminars maintenance and operations personnel on proper baghouse functionality.
- Adjust cleaning cycle logic or sequence to be staggered and identical to all units.

To: Intermountain Power Service – Delta, Utah
Date: Decemeber 2, 2004
Page: 9

We are confident that this information will be very valuable in planning, budgeting and improving your ventilation systems. BHA appreciates the opportunity to work with the good people at IPP and look forward to helping you implement the recommended changes.

Coni Williams will provide you with applicable quotes under separate cover and will be contacting you soon to review this report. In the meantime, if you have questions or require additional information, you can contact us at 1 800 821 2222.

Sincerely,

BHA Group, Inc.

Reed C. Finch
BHA Consultant/Technical Advisor

cc: Coni Williams - Sales Representative, BHA Group, Inc.

Leyana S. Shelton – Project Management, BHA Group, Inc.